① which can be used as prim stand in Redox.

a- K_2CrO_4 b- $K_2Cr_2O_7$ C- oxalic acid d- $KMnO_4$

e- a,b f- b,C

② which can be used as redox indicator :-

a- EBT b- Fe^{+3} C- DAPI d- all

③ $KMnO_4$ in acid med. gain ---- electrons to Mn^{+2}

a- 2 b- 4 C- 5 d- none

④ which is specific indicator for Fe^{+3} :-

a- EBT b- KSCN C- X.O d- KI

⑤ which is self indicator -

a- $K_2Cr_2O_7$ b- $KMnO_4$ C- I_2 d- PAN

⑥ Methylene blue is ---- ind.

a- redox b- PH C- a-base d- none

⑦ Constant for each G.E :- Salt bridge Elec

a- assymetry Potential b- boundary Pot C- Junction potential

⑧ has pH range 0-8 :-

a- GE b- antimony E C- Quinhydrone E

(9) type of Glass sensitive to Na^+ — have the besia

a- lithium silica ~~b-~~ c- ~~Corning-3~~

NAS

(10) Det Co_2 gas :-

a- Clark electrode b- gas sensing probe Calomel E

(indicator electrode)

(11) 2ndry ref. E :-

a- 0.1 M CE b- CE c- SHE

(12) Liq. ion exchanger to det K^+

a- dodecyl phosphate b- exchange resin - valinomycin

(13) hygroscopicity :-

a- affect $I_3^-/3I^-$ system b- affect Complex formation

c- affect G E

(14) to det. glucose using $I_3^-/3I^-$ system u use :-

a- borax b- $NaHCO_3$ c- NaOH

(15) to det Arsenite iodimetrically we add

a- HCl b- $NaHCO_3$ c- NaOH

(16) to det ferrous iodimetrically we add

a- PO_4^- b- $P_2O_7^{-2}$ c- Zn^{+2}

① To titrate Cu^{+2} by EDTA ... is titrated by

a- NH_3 / NH_4Cl b- ... c- CH_3COOH / CH_3COONa

d- either a or c e- neither one

② which can be titrated by EDTA at pH 1-3

a- Bi^{+3} b- Hg^{+2} c- Fe^{+3} d- other e- neither

③ used as pH Indicator -

a- DPA b- EBT c- kscn

④ which can be chelated by EDTA :-

a- Ag^{+} b- Ni^{+2} c- Co^{+3}

⑤ Masking agent for mercuric ion -

a- BAL b- TEA c- KI

⑥ liberate Zn^{+2} from its Cyano Complex

a- glucose b- NaOH / HCHO c- HCHO

⑦ specific indicator for Fe^{+3} :-

a- EBT b- kscn c- xo d- HR

⑧ Quadridentate Ligand

(11) Methylene blue is one of the ---- indicator.

a- Redox b- PRI c- Non-aqueous d- base

10 used to det. ald.:-

a- KI$_3$ b KIO$_3$ c- I_2/OH$^-$ (hypoiodide)

11- Component of ZRR. a- $ZnSO_4$ b- H_2SO_4 c- HCl

12- KMnO$_4$ is a Medium gain ---- electrons to Mn^{+2}:-

a- 2 b- 5 c- 4 d- none

13- used as 1°std standard oxidant

a- $KMnO_4$ b- $K_2Cr_2O_7$ c- (COOH)$_2$ 2H$_2$O (oxalic a.) d- $Na_2S_2O_3$

(14) back titrant for periodate (IO_4^-) :-

a- $Na_2S_2O_3$ b- KI_3 c- Na_3AsO_3

(15) lower oxid potential of Fe^{+3}/Fe^{+2} system:-

a- Zn_3O_4 b- $H_4P_2O_7$ (conc.) c- HCl

(16) Component of KF Reagent:-

a- SO_2 b- $MnSO_4$ c- KI / NH_3

(18) 2nd Ref.

a- SHE ~~b~~- SCE c- HE CE X

(19) electrode of the first type

a- Ag^{o} | AgBr ~~b~~- Zn^{o} | Zn^{+2} c- H_2 | H^+

(20) Single Crystal ISE -

a- GE b- LME ~~c~~- F- ISE

(21) type of 2nd type whose potential is pH dependant

a- GE b- Quinhydrone E ~~c~~- antimony E

(22) electrode whose potential depend on Br^- ions :-

a- Zn^{o} | $ZnBr_2$ (solu.) ~~b~~- Ag^{o} | AgBr (solid) c- CE

(23) Iodometry can det. :- (red.)

a- Fe^{+2} (Iodi) b- H_2O_2 ~~c~~- $K_2Cr_2O_7$

(24) hypoiodite is :-

a- strong oxidant ~~b~~- mild oxidant c- mild Reductant

(25) KIO_3 in 2-4 N HCl gain ----

a- 6 electrons to I^- ~~b~~- 5 electrons to I_2

ton conc of Cl

a- directly b- inversely c- no

(27) benzoquinone is --- in quinhydrone electrone

a- oxidized b- Reduced c- Complexed

(28) has pH range of

a- GE (2-12) b- [illegible] Q (0-9) c- DA [illegible]

(29) Composed of SiO2, CaO, Na2O

a- DAS b- Ethyl silica c- soda lime

(30) Consist of SO_2 & I_2 in an anhydrous solvent

a- ZRR b- Ki reagent c- QE

(31) KMnO4 is a red. in presence of HClO4 reduced to

a- Mn^{+2} b- MnO_4^{-2} c- Mn^{+3}

(32) KMnO4 used to det. Polyhydroxy Compounds in ---- medium

a- a b- a + F c- basic

(33) standardization of KMnO4 by

a- $(COOH)_2$ b- ((illegible) c- $K_2Cr_2O_7$

(34) if titration of 50 Fe^{+2} by Ce^{+4} the Potential after addition of 2 ml Ce^{+4} & 4 ml Ce^{+4}

solution (illegible)

Analatycal Method

1] M.C.Q

a) which of the following compounds is used as P.M indicator
* No * DPA * X O * either

b) which of the following can be chelated by EDTA ?
* Ag * Co * Na * either * neither

c) To titrant Ca^{+2} by EDTA , The PH of the medium should be adjusted by :-
a) NH_3/NH_4Cl buffer ✓ b) HNO_3 c) neither

d) CH_3COOH/CH_3COOK

e) which of the following cations could be titrated by EDTA in medium having Ph → 3 ?
a) Bi^{+} b) Hg c) Fe d) either ✓ e) Neither

f) KCN can mask the following cations :-
1) Zn 2) Cd 3) Na 4) Zn + Cd ✓

g) which of the following Compound can be used as primary standard redox titration
* $K_2Cr_2O_7$ * $CoCl_2$ * $KMnO_4$ * A + B

h) which of the following Compounds can be used as redox indicator ?
* Ferric ② Ferroin 3) DPA 4) b & c 5) A & b

i) The equivalent weight of $KMnO_4$ (Mol wt) = $\frac{158}{5} = \frac{M.wt}{5}$ when used in acid medium and in presence of F^- equal :- 1) 52.86 2) 39.50 3) 39.60 4) neither

(B1) $MnO_4^- + 8H^+ + e^- \rightarrow Mn^{+2} + 4H_2O$ acidified by acid → in presence of F^-

$MnO_4^- + 8H^+ + 4e^- \rightarrow Mn^{+3} + 4H_2O$

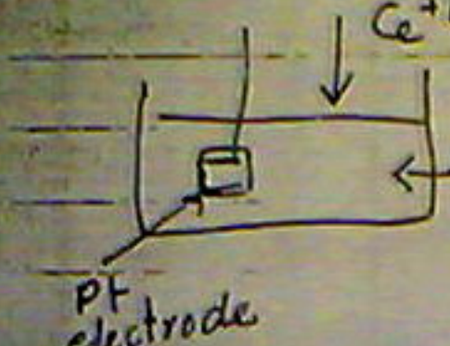
Molecular weight / No. of electrons

* In Alkaline medium

$MnO_4^- + 4H^+ + 3e^- \rightleftharpoons MnO_2 \downarrow + 2H_2O$

[In presence of Ba^{+2}

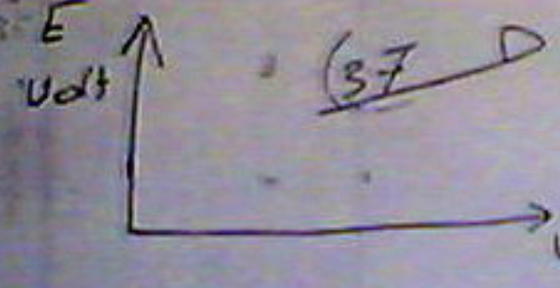
$MnO_4^- + e^- \rightleftharpoons MnO_4^{-2}$



الأسئلة النظرية

Calculate the E of the cell?

$E = E_0 + \frac{0.059}{n} \times \log \frac{[oxd]}{[Red]}$



Point	Formation	Value E
0	—	—
50%	$\frac{E_1 + E_2}{2}$	E°
100%	E°_{form}	$\frac{E_1 + E_2}{2}$
200%		

Q3 → Bromination of SA

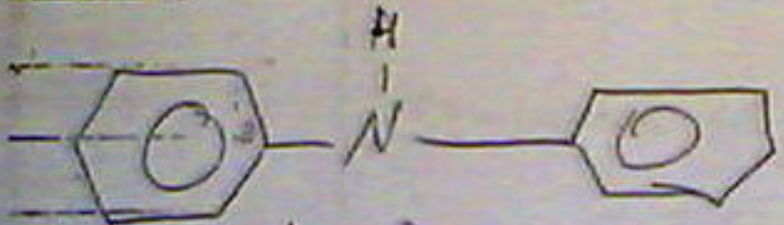
Q) The iodometric titration of Br_2

Solution $Br_2 + 2I^- \rightarrow I_2 + 2Br^-$

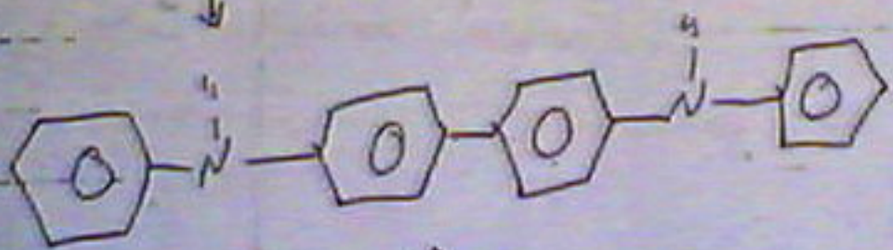
$I_2 + 2S_2O_3^{2-} \rightarrow 2I^- + S_4O_6^{2-}$

⇒ The Mechanism of DPA as Redox indicator

Solution kalfehizer reagent Cr^{3+}



colorless



$+2H^+ + 2\bar{e}$

DPB colorless

DBA violet

مـــاز نجاه

- Equivalence weight of $KMnO_4$.

1- In acid medium:

$$MnO_4^- + 8H^+ + 5\acute{e} = Mn^{++} + 4H_2O$$

∴ equivalence weight = $\frac{\text{Molecular weight}}{\text{No. of electrons}}$

$= \frac{M \text{ weight}}{5}$

∴ In Presence of F^-

$$MnO_4^- + 2H^+ + 4\acute{e} = MnO_2 + 4H_2O$$

∴ equivalence weight = $\frac{M. \text{ weight}}{4}$

3) In alkaline medium.

$$MnO_4^- + 4H^+ + 3\acute{e} = MnO_2 + 2H_2O$$

∴ equivalence weight = $\frac{M \text{ weight}}{3}$

4) In Presence of Ba^{++} ions.

$$MnO_4^- + \acute{e} = MnO_4^{--}$$

$MnO_4^- + e^- \rightleftharpoons MnO_4^{--}$

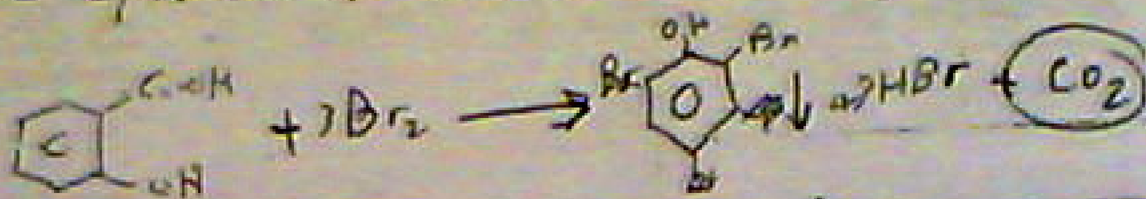
∴ equivalence weight = $\frac{M. \text{ weight}}{1}$

$2H^+ + 2e \rightleftharpoons H_2$

$E = E^o_{H^+/H_2} + \frac{0.059}{1} \log \frac{[H^+]^2}{PH_2}$

- Draw NEAT diagram to show primary reference electrode (NHE) and write ion-electron half equation as it is nernest equation

- Complete equation of bromination of salicylic acid



- Mechanism of action of DPA as redox indicator.

Mechanism of action of KF agent

5 anhydrous reagent

It its color is brown and if there is water it turns to yellow color

- [illegible] Calculate E potential at concentration 0.00% & 50% & 100% & 200%

Fe^{++}/Fe^{+} (1 M H_2SO_4) // Ce^{4+}/Ce^{3+} (1 M H_2SO_4)

- Iodometric titration of Br_2

$Br_2 + 2I^- = I_2 + 2Br^-$

$I_2 + S_2O_3 = 2I^- + S_4O_6^{--}$ (2)

= H c ...

1) Which cations can be determined by EDTA:

a) Ag^{+} b) Cu^{++} c) Na^{+} d) either one e) neither one

KCN can mask:

a) Zn^{++} b) Cu^{++} c) Cd^{++} d) a & b e) a & c

Primary standard redox titration

a) $K_2Cr_2O_7$ b) $(COOH)_2$ c) $KMnO_4$ d) a & b e) a & c

4) What are used as redox indicators

a) Eriochrome black T (EBT) b) Ferroin c) DPA d) b & c

5) N.B.:
Bi^{+++} & Hg^{++} & Fe^{+++} can be titrated by EDTA at pH = (1–3)

*15

Match.

Column A	Column B	
1- I_3^- / $2\bar{O}H$	PAR - Pyridine azo resorcinol (curcumin reagent)	9
2- KIO_3	- Consist of SO_2 & I_2 in non aq. solvent	6
3- $Na_2S_2O_3$	PAN Pyridine azo naphthol	8
4- SO_2	✓ Atomic emmision spectroscopy	10
5- KI_3	- standard Calomel electrode	12
6- KF	- has blue Color when oxidized	7
✓7- Variamine blue B	✓ Gas Liquid chromatography	11
✓8- PAN	- used to det RCHO (KIO_3)	1
✓9- PAR	- titrant of Andrew's method	2
✓10- AES	- titrant used in iodimetry	5
✓11- GLC	- back titrant in iodometry	3
✓12- SCE	Component of KF reagent	4

Column A	Column B	
1- EBT	- rigid chelating agent	7
✓2- EDA (ethylene diamine)	- proposed term chelate	6
3- Trien	- has orange Color in pH > 11 ✓	1
4- EDTA	- has yellow Color in a medium	8
✓5- DMG	- tetradentate ligand	3
6- Morgan, Drew	✓ has 2 OH groups & is organic	5
7- porphyrin	- tetra amino a	4
8- X-O	- Didentate ligand	2
9- NH_3	- det of CN^- using $AgNO_3$	10
10- Argenometric	- used as ind in Liebig method	11
11- KI / NH_3	- nutral unidentate ligand	9

DMG ppt

→ MCQs:-

1- in KIO_3 as an oxidant use as Ind :- a

a- $CHCl_3$ b- XO C- Murexide d- NH_3 / NH_4Cl

2- I_3^- / $2OH$ used for det of :- b

a- amine b- glucose C- NH_3 d- phenol

3- the titrant in Andrew's method :-

a- KIO_3 b- I_2 C- IO_4^- d- $KMnO_4$ a

4- which of the following is thermal analysis:- c

a- AAS b- GLC C- TGA d- AES e- none

5- which is antiseptic :-

a- phenol b- salicylic à C- benzoic à d- none a

6- antifungal white field ointment :-

a- variamine blue B b- mix of salicylic à & benzoic à b

C- NH_3 / NH_4Cl d- sulfonamides

7- the antimicrobial agent is a

a- sulfonamide b- PAN C- PAR d- phenol

8- to titrate Ca^{+2} by EDTA the pH should be adjusted by- a

a- NH_3 / NH_4Cl b- HNO_3 C- CH_3COOK / CH_3COOH d- neither one

9- which of the following can be titrated by EDTA at PH:1-3 d

a- Bi^{+3} b- Hg^{+2} C- Fe^{+3} d- either e- neither

10- which of the following can be used as 1ory standard in redox reaction : d

a- $K_2Cr_2O_7$ b- $(COOH)_2$ c- $KMnO_4$ d- a&b

11- which is redox Ind :- d

a- Erio-t [EBT] b- ferroin c- DPA d- b&c

12- equivalent wt of $KMnO_4$ (158) is a med + F^- is :- b

a- 52.66 b- 39.5 c- 81.6 d- neither

→ Complete :-

1- ..... is specific No. of ligands that are bonded to each metal ion — Co-ord No.

2- unidentate ligand may be classified into:

a) anionic eg CN^-, Cl^-, SCN^-

b) neutral eg NH_3, H_2O

3- multidentate ligand may be called chelating agent that form ring structure when bonded with metal

a- triethylene tetramine is a tetradentate ligand can attach with metal ion at 4 sites of attachment.

5- chelating agent may be :-

(a) rigid which is contain rings (planer) eg Porphyrins

(b) Flexible " " Conformle eg EDTA

6- $[Ag(NH_3)_2^+]$ Complex is linear in shape while $[Fe(CN)_6^{-3}]$ Complex is octahedral in shape.

7- Small size & large charge on the metal ion ↑ the Complex stability ex Fe^{+3} more stable than Fe^{+2}

8- as the ligand size ↑, the Complex stability increase eg I^- Complex more stable the Br^- Complex

9- As the no of rings per ligand ↑, the stability of the metal chelate increase

10- Cd^{+2} Can be titrated with EDTA using EBT while Al^{+3} Can't due to form more stable Complex with EBT more than EDTA - Al Complex

Q.II. Mark (✓) for the Correct statement and (✗) for The false one:-

1- for Ca-ISE; the potential plot against Ca^{++} activity ha slope equals 0.059 Volt. (✗)

2- for 1st Kind electrode; the plot of electrode pot. against pM give inversily linear relation. (✓)

3- for 2nd Kind electrode; The plot of electrode potential against Concentration of Cl^- is directly proportional linear relation. (✗)

4- In Nernest equation 2.3RT/f equal to 0.059 when temp equals 293 K. (✗)

5- Fe (s) / Fe^{++} is an electrode of 1st Kind (✗)

6- The pH-GE is an electron trans fere electrode (✗)

7- Sb_2O_3 (s) / 2 Sb(s) electrode is pH responsive electrode (✓)

8- the pH range of Qunhydrone electrode is 0.0 - 8.0 (✓)

9- Lithia Silica glass electrode is used to determine [?] (✗)

10- the pH renge of GE is 0-13 (✓)

11- GE interferences with dehydrating agent, soln of ions and surface active agents (✓)

12- He is pH responsive unLimitted (✓)

13- Antimony electrode interferences with oXidizing agents, Cu-ions and anions of hydroXy acids (✓)

14- Quinohydrone electrode interferences with protein and amines (✓)

15- HE interferences with oXidizing agents and reducible organic substances. (✓)

16- GE has high resistance as disadvantages (✓)

17- Antimony electrode is not completely reversible as disadvantages. (✓)

18- Hydroquinone electrode is limited inpH range and easily distractive. (✓)

19- HE electrode and Antimony electrode is electrontransfer electrode while GE is an ion exchange electrode. (✓)

20- The potential of CE depend on [cl] and temperature (✓)

21- Ag|AgBr electrode Can be used to determine [Br⁻] (✓)

22- The boundary potential of Ag|AgCl electrode depends on [Cl⁻] ✗

23- Co_2 sensing probe is a Complete ECC ✓

24- The responsive membrane of f-ISE is a single crystal of NaF ✗

25- in measuring pF by f-ISE the sdn. should be acidic. ✓

26- EDTA is an aminopolycarboxylate ligand ✓

27- $H_2N.CH_2(CH_2)_4.CH_2NH_2$ is abidentate Ligand ✗

28- $(CH_2NH_2)_2$ is a quadridentate ligand ✗

29- As The radius of ligand is larger. The stability of Complex increases ex $I^- > Br^- > Cl^-$. ✓

30- As The radius of Metal is larger, The Complex stability increase. ✗

31- By increase The donting Power of ligand The Stability increase ex $N \gg O > Cl^- > Br > I^-$. ✗

32- Phenanthraline is a tridentate ligand and rigid. ✗

33- Oxine is a hydroxy bidentate ligand. ✓

34- amnoacid may be Considered with metal as

35- all metal can have more than one coordinate no. ✗

36- Titration with EDTA is Chelometric titration. ✓

37- All metal Complexes are stable in basic Medium. ✗

38- Disodium salt of EDTA is soluble in H_2O. ✓

39- pH value has no affect on the Complexes Formation ✗

40- Nitric acid is a suitable medium for Bi^{3+}. ✓

41- In Andrew's method, starch soln is used to indicate the end point. ✗

42 MnO_4^- able to determine H_2O_2 ✓

43- Iodimetry use Iodine directly as oxidant while Iodometry Iodine liberated from the reaction ✓

44- Arsenate can be titrated Iodimetrically. ✗

45- For $AsO_3^{-3} + I_3^- + H_2O \rightleftharpoons AsO_4^{-3} + 3I^- + 2H^+$ by increasing pH value find the reaction go to the formation of products. ✓

46- Use starch as indicator in Iodimetric titration and added at after end point. ✗

47- Hypoiodite (I_3^-/OH^-) can be used in the determination of aldehydes and glucose. ✓

48- Androw's reaction use strong acid medium and an chlorated solvent with potassium iodate reaction. ✓

49- Iodine standard is prepared by dissolving it in KI why?... ✓

50- Can determine Cu^{2+} By Iodometry ✓

51- Easily can use starch as indicator in case of I^-/I_2 system. why?? ✗

52- CuSCN is a white insoluble ppt ✓

53- Starch indicator For Iodimetry and Iodometry is added at The Start of titration. ✗

54- The Librated Iodine equivalent to reductant (oxidant) That in Solution. ✗

55- Iodometry Can determine oxidants as $Cr_2O_7^{-2}$ ✓

56- Iodometry Can determine Cu^{2+} in The presence of SCN ✓

57- Hypoiodite is very mild oxidizing agent ✓
it oxidize glucose and aldhydes

58- The excess remaining of I^- Can be determined ✓
by acidification by H_2SO_4 to give I_2 -
as The equation ——

59 Potassium Iodate is a strong reductant in acidic (oxidant) ✗
medium (4M HCl) ——

60- In KIO_3 titration Can not use starch as ✓
indicator. due to ——

61- KIO_3 Can be used in The determination ✓
of I^-, hydrazine and hydrazine drivatives ✓

62- KIO_3 able to oxidize I_2 into I^-. ✓
The color of I_2^- is yellow —

63 Most Iodine titration must be Carried in ✓
Iodine flask with stopper.
Because —— I_2 is volatile

64- To decrease The Conc. of acid from 4M HCl ✓
to 1-2M Can Use KCN
Because —— form ICN Complex which is more stable than I_2^-

65. H_3BO_3 Can be used as preservative for starch to prevent or decrease The Micro-decomposition. ✓

66- Can use SCN^- as a specific indicator For Fe^{3+} ✓

67- Salycilic acid is Colorless will when bonded with Fe^{3+} Give violet while Variamine blue B when oxidize will Give blue ✓

68- Ceric ammonium nitrate is Pry Standard substance and Can use a self indicator (✓)

69- Also, use Ferrin/Ferroin System as a redox indicator in Case of Ce^{4+} titration (✓)

70- Can use Ce^{4+} in any medium in The titration. (X)
- This is due to The titration Carried only in acidic medium which prevent The precipitation of $CeO_2 \times H_2O$ (hydrated ceric oxide)

71. Can use with $KMnO_4$, EBT as indicator. (X)
- due to EBT is a pH indicator and $KMnO_4$ is self indicator.

72. BAL Can be used as indicator For pb^{2+} (X)
- BAL " " " " Masking For pb^{2+}

73. TEA used as a Masking agent For Al^{3+}. (✓)

74. Bi^{3+} and Mg^{2+} mixture Can be analysis by changing The buffer system (✓)

75. Bi^{3+} and Fe^{3+} mixture Can be analyse by Changing The pH of The medium and masking process. (X)

- Can analyze by adjustment The oxidation State of Fe^{3+} as $Fe^{3+} \xrightarrow[\text{acid}]{\text{ascorbic}} Fe^{2+}$

76. Oxalate anion can be used as applating agent for Mg^{2+}.
- oxalate can be used for Ca^{2+}

77. Acetate or hexamine can be use with the titration of Cu^{2+}, Pb^{2+} and Bi^{3+} (✓)
- and by changing the pH again. Can analyse the others.

78. I_2 is a volatile while Br_2 is not. (X)

79. Easily to prepare a standard soln (X)

80. Bromine is unstable solution and unaqueous solution

81. Bromine is prepared in situ from $KBrO_3/5Br^-$ soln (✓)

82. Quantitative bromination able to determine aromatic ring activating by ...

83. Br_2 is produced by make the soln is alkaline (X)

84. Balance the equation

$$BrO_3^- + 5Br^- + 6H^+ = 3Br_2 + 3H_2O$$

85. put the sample and the Brominating agent in iodine flask then acidify by Hcl then put them in sunlight (X)

86. Br_2 can be detected iodometrically technique. (✓)

87. Phenol is antiseptic. « Complete »

88. To avoid the volatilization of phenol added NaoH to give the stable form which is Sodium Phenoxid.

89. Phenol when Brominated Give tribromophenol.

91. Antifungal ointment Contain benzoic à and Salicylic à.
92. Sulfonamides maybe Consider Weakacid.
93. Thyamol blue used as indicator in Case of Sulfonamide with bromonating agent in Dimethyl formamid Solvent
94. Oxine Can be use as abidentate ligand and use in The determination of Mg^{++} by Forming Mg oxinate Complex
95. EDTA Can determine non metal like S and P (✓)
96. How Can determine Mg^{2+} by using Oxine??
97. Oxine maybe 6 or 7-hydroxy Quinoline. (X)
98. emf Can be experimently measured. (✓)
99. The electrode potential Can be measured → experimently but Can measured by ---- Nernest equation (X)
which Statdas ..... = ... + ...
100. NHE acts as ..... electrode.
101. The potential of Calomel electrode depend on (X)
The AgCl Conc Because ----
102. SCE affected By Temp. (X)
This is due to .....
103. The potential of The 1st Kind electrode deped on The Conc of The metal. while it (X)
proportional to The Conc of it's metalion
104. Tungesten act as indicator electrode (X)
- This is due to Strain or deformation of Crystal Stucture

(Inversily / directly) proportional to The conc. of Cl^-

106. Inert electrode responsible for ensure electrical Contact. (✓)

107. By changing The inert electrode The potential of Ion/ion System will alterd (✗)

108. HE is limited but use it as SHE as a reference electrode. (✓)

109. HE is azry kind electrode. (✗)
- It is a Iry kind

110 P-benzohydroquinone Can be (reduced or oxidized) in hydroquinon electrode.

111. Cds with Ag_2S is a crystalline electrode which sensitive to Cd^{2+}. (✓)

112 Valinomycin Can be detect The K ion it by Ca-ISE. (✗)
- By K-ISE

[Silk]

- P. 32: to det. E° (stand. electrode Potential) we use NHE
- P. 50: in KF reagent Pyridine used to dissolve I_2 & SO_2, used also as base → ↑ rate of reaction
- P. 52 - HCHO (antiseptic sol.)
- P. 54: Lugol's sol.n (used in hypothyroidism)
  ↳ in Large's med we Can use starch as ind. (Cl & Br)
- P. 62 bromometry — BHA & Paraben → Can be det
  - but, BHT → Can't be det.
  ↳ Sulfide Can be det. using I^- (hypo iodide)